Hotel Decision-Making During Multiple Crises: A Chaordic Perspective

Abstract

This study focuses on the decision-making process of Greek accommodation providers during a period characterised by multiple crises (recession; political and financial instability; social unrest; a refugee crisis). Using fuzzy-set Qualitative Comparative Analysis the research employs a nationwide survey of 243 hotel managers/owners. The results reveal five sufficient configurations characterised by the development of enterprising competitiveness, the operational aspects, marketing and promotional concerns, business productivity and efficiency, and the financial issues of hotels. The research also compares asymmetric analysis with the dominant linear methods (regression and Cramer's V), highlighting the suitability of the former in chaordic systems. It also progresses from fit to predictive validity for the examined models. The study's contribution is to both theoretical and methodological tourism and hospitality domain.

Keywords: Hotels; chaos and complexity; chaordic systems; fsQCA; crisis; Greece

1. Introduction

Crises have a heavy impact upon tourism since they cause significant reduction in the number of travellers (Alegre et al., 2013; United Nations World Tourism Organization, 2011), and force the tourism and hospitality industry to focus its recovery on the critical examination of operations and performance and the reassessment of strategies in a bid to gain competitive advantage (Pappas, 2015a). According to Perles et al. (2016) the tourism and hospitality literature includes studies that examine the impact of crises in three different directions: (i) evaluation of demand aspects [i.e.: visitor arrivals is used as variable of interest] (ii) analysis of industry reactions [i.e.: cost reduction; reorientation of competitiveness] and (iii) the influence of crises on tourism destinations [i.e.: temporary competitiveness effects; market share fluctuations]. Those studies aim to provide a better understanding of the influence of attributes which affect tourism and hospitality and their respective decision-making, especially in regions suffering from serious crises (Papatheodorou and Pappas, 2017). Still, as illustrated in Figure 1, one of the fundamental characteristics of crises is that they can generate multiple crises, or even combine with other parallel crises.

Please insert **Figure 1**

Since the traditional approach of research in tourism and hospitality assumes considerable stability, and is dominated by linear analysis as the appropriate profile for stable systems (Pappas and Papatheodorou, 2017) inevitably it didn't focus on the complexity generated by multiple crises. Therefore, the tourism and hospitality literature is silent on this matter.

In Greece, the current economic recession and the subsequent social and political crises have had a severe impact upon tourism, leading in 2012 to a 5.5 percent drop in international arrivals (compared with 2011), heavily affecting its hotel industry (Merkenhof, 2014). From 2013 onwards, foreign tourist arrivals steadily increased, mainly due to crises in neighbouring tourism destinations (for example, terrorist strikes in France, Tunisia and Turkey; war in Syria; the Lybian civil war; political instability in Egypt), but tourist consumption and domestic tourism are in a state of constant decline (Turner, 2015). Even so, due to the substantial increase in international tourism, tourist revenues also increased, accounting for a GDP contribution during 2015 of 24 percent (at the beginning of the recession in 2010 the respective contribution was 15 percent), and highlighting tourism as the most important contributor to the country's emergence from the economic crisis (Smith, 2016). During those years, the mismanagement of the recession by the Greek government, the implementation of extreme austerity measures, and the unrealistic assumptions and demands of Greece's creditors for growth and deficit reduction (Elliot, 2016) on 2015 levels have led to social unrest and riots, marked political instability (resulting in two national elections and a referendum), and capital controls in Greek banks. They have also brought Greece to the verge of an exit from the European Monetary Union (EMU). However, during 2015 Greek tourism had to face one more challenge; since it has, arguably, been the country most affected by the refugee crisis, its tourism and hospitality industry (especially on the islands of the eastern Aegean sea) have had to confront considerable problems (Leadbeater, 2016). Summarising the above, internally Greek tourism has affected from the crises of recession (reduction of disposable income; increase of occupational uncertainty;

minimisation of consumption especially in elastic products such as tourism etc), and the social unrest (safety and security aspects; destination brand image etc) and political instability (investment prospects; efficiency of state administration; implementation of capital controls etc.) generated by recession and its consequent austerity. Externally, Greek tourism has mainly influenced by the recession in Europe (reshaping of inbound tourist flows; tourist consumption etc), the Arab spring (redirection of tourist flows to European Mediterranean destinations), the increase of international terrorism in European (i.e. France) and other Mediterranean (i.e.: Turkey; Egypt) destinations (safety and security), and the refugee crisis (sharp decline of tourism especially in eastern Aegean islands)

The combination of all the above has created a chaotic business environment in Greek hotels, considerably increasing the complexity of their managers/owners' tourism decision-making. Olmedo and Mateos, (2015) indicate that in the tourism and hospitality industry the process of decision-making is characterised by high levels of complexity. This is because tourism decision-making embeds aspects of high diversity, rapid and constant change, large number of elements interrelated with each other, impossibility of perfect knowledge due to imperfect information, and the co-existence of simultaneous order and disorder in a manner that is able to compare the key concepts involved in the complexity paradigm versus the traditional ones in simplification paradigm (Olmedo, 2010). As a result, the dominant reductionist research approach does not permit the effective comprehension of tourism as a complex phenomenon (McDonald, 2009). This study takes into consideration the pressures generated by multiple parallel crises (i.e.: a refugee crisis may generate pressures or wages, labour market, health conditions, cultural proximity etc. [Alix-

Garcia, Bartlett, and Saah, 2012; Baez, 2011]; recession can generate pressures in disposable income for tourism, occupational uncertainty, destination selection decision-making etc. [Papatheodorou and Pappas, 2017]), and focuses on the complexity of decision-making from the Greek hotel manager's/owner's point of view with reference to crisis resilience. More specifically, it evaluates the impact of chaordic (chaos vs order) systems on hotel decision-making processes in terms of the influence of operational costs and involvement, labour aspects, marketing activities, innovation, competition, pricing policies, use of Information Technology, and cooperative initiatives in crisis resilience. It also takes into consideration the category and operational type of the firms examined. In terms of literature, the theoretical contribution of the paper is based on the provision of a better understanding of the complex tourism-crisis relationship and its implications for decision-making in tourism accommodation. It does so by explaining the complexity of combining a number of different aspects related with the operations of accommodation establishments, and by proposing five different pathways for operational decision-making. Methodologically, the study implements fuzzy-set Qualitative Comparative Analysis (fsQCA), which is regarded as an innovative tool in tourism and hospitality studies and the service sector more generally. Furthermore, the research highlights the suitability of nonlinear (asymmetric) research in tourism as opposed to the more dominant correlational analyses (regression and Cramer's V). It also progresses from fit to predictive validity for the proposed models.

2. Chaos complexity and the chaordic perspective

In hotel management studies a plethora of decision-making frameworks is available from previous research. These frameworks focus on numerous aspects such as

revenue management (Pereira, 2016), sustainability and green practices (Chen, Chen, Zhang, and Xu, 2018), information technology (Nguyen and Coudounaris, 2015), risk and crisis management (Nguyen, Imamura, and Iuchi, 2017), marketing activities (FitzPatrick, Davey, Muller, and Davey, 2013), innovation (Shaw and Williams, 2009), operational and economic performance (Marco, 2012), pricing issues (Aziz, Saleh, Rasmy, and ElShishiny, 2011), labour policies and costs (Ruzic, 2015), cooperative and international strategies (Chen and Dimou, 2005), and competition issues (Abrate and Viglia, 2016). This amalgam of hotel management frameworks highlights the complex interdisciplinary in the respective field. It also showcases the chaotic business environment and the generated challenges for an effective decision-making, since numerous factors and conditions need to be taken under consideration.

In recent years, research interest in controlling the chaos of business systems has become increasingly strong (Du et al., 2009). The theory of chaos was introduced in 1963 (Lawrence et al., 2003) and proved useful in complex system analysis (Mahmoudabadi, 2015). In essence, the theory suggests that even small behavioural differences are able to produce substantial diverging outcomes to dynamic systems making it impossible to predict patterns on a long-term basis (Kellert, 1993). Chaos occurs in a deterministic nonlinear system (Williams, 1997) and is dependent on initial conditions and the density of periodic points (Davaney, 1989). According to Williams (1997) and Hwaring and Yuan (2014) the following are distinct features of chaos: (i) nonlinearity and non-randomness [i.e.: a direct relationship towards action and reaction] (ii) apparent disorder where the variables seem to be disorganised and irregular [systems can exhibit strange attractors whatever their dimensionality] (iii) any kind of order, pattern or structure may be found in phase space [every point in the

space is approached arbitrarily closely by periodic orbits] (iv) the ranges of variables have finite bounds [specific parameters define the system's functionality], and (v) a sensitivity to initial conditions [arbitrarily close approximation of each point by other points]. Complexity theory has evolved from the theory of chaos, and is used primarily for research with complex characteristics. It "deals with systems that have many interacting agents and, although hard to predict, these systems have structure and permit improvement" (Zahra and Ryan, 2007, p.855). The theory of complexity deals with multi-elemental systems that may be well organised and produce (almost) predictable behavioural patterns (Baggio, 2008). Complexity includes two dimensions (Garud, Kumaraswamy, and Karnøe, 2010; Vergne and Durand, 2010): (i) path-dependence (exogenous and manifest as unpredictable, non-purposive, and somewhat random events), and (ii) path-creation (emergent and serving as embedded contexts for ongoing action). Furthermore, the predictability of the systemic behavioural patterns is less straightforward when the degree of complexity increases (Fitzerland and Eijnatten, 2002).

The 'chaordic system' is a concept derived in response to the strong relationship between chaos and complexity (Fitzgerald and Van-Eijnatten, 2002). Its name comes from the technical term 'chaord', which is an amalgamation of the words chaos and order (Van Eijnatten et al., 2007). According to Olmedo (2011) a chaordic system is characterised by a complex and dynamic set of connections between elements that form a unified whole, whose behaviour is simultaneously based on unpredictability (chaos) and patterns (order). The term 'chaordic' was suggested by Hock (1995) in an effort to place emphasis on the character of complex systems as chaotically-ordered entities. As Olmedo and Mateos (2015) suggest, chaordic systems have three main

features: (i) they make long-term planning impossible (ii) they are in constant change, and may spontaneously and endogenously form new complex structures, and (iii) they are affected by unexpectedly dramatic changes. Therefore, a chaordic system is characterised by long memory (it concerns long-range correlations and chaotic oscillations embedded in time series and in nature they are non-stationary [Lahmiri, 2017]), self-organisation (the systemic exhibition of emergent properties to internally organise their operations/behaviour [Kauffman, Peterson, Samuelsson, and Troein, 2003]), resilience (the ability of the system to withstand, recover, and bounce back [Mycek et al., 2017]), asymmetry (the lack of statistical distribution, equality or equivalence between functions, operations or behaviours [Waz and Waz, 2009]), and sensitivity to initial conditions (the ability of a system's behaviour to rapidly diverge from slightly different conditions [Olmedo and Mateos, 2015]).

From a managerial perspective, hospitality industry tries to handle crises through the implementation of numerous practices, such as reshaping marketing and promotional activities (Candemir and Zalluhoglu, 2011), introducing new products and management programmes, attracting new markets (Okumus and Karamustafa, 2005), improving company operations and competitiveness (Naidoo, 2010), reducing the costs of production (Ukakturk, Bekmenzci, and Ukakturk, 2011) and personnel (Wang and Ritchie, 2012), employing different pricing policies (Eugenio-Martin and Campos-Soria, 2014), increasing innovation (Falk, 2013), and extensively using Information Technology (Jia, Shi, Jia, and Li, 2012). When a crisis occurs, the aspects of complexity in the business environment dramatically increase (Coskun and Ozceylan, 2011); thus, the theory of complexity may also be linked to emergency management (Morakabati, 2016; Ramalingam, 2013), and the complexity of the

196 formulated chaordic system needs to be examined (Papatheodorou and Pappas, 2017).
197 Since “long term forecasting is almost impossible for chaotic systems, and dramatic
198 change can occur unexpectedly; as a result, flexibility and adaptiveness are essential
199 for organisations to survive” (Levy, 1994, p.176). Therefore, it is essential for tourism
200 and hospitality businesses to gain resilience in the face of inevitable crises
201 (Paraskevas, 2006). As previously mentioned, when the degree of complexity
202 increases the prediction of the systemic behavioural patterns is less straightforward
203 (Fitzerland and van-Eijnatten, 2002). As a result, the development of a strong tourism
204 brand provides a ‘lock-in effect’ (as referred to chaos theory), meaning that brand
205 loyalty increases and tourism and hospitality firms further enhance their resilience to
206 crises and disasters (Speakman and Sharpley, 2012). This is because the complexity
207 of successful subordination of the competing tensions permits consumers to control
208 their behaviour (Berlyne, 1971), encouraging them to become brand loyal, since there
209 may be a repetition of patronage with the seller that comes to mind more easily
210 (Murray, Elms, and Teller, 2017). Therefore, summarising the previous aspects, the
211 steps for examining relevant chaordic systems should include: (i) the identification of
212 crises affecting the destination (ii) the evaluation of the overall complex impact
213 generated from crises, and (iii) the examination of the industry’s response to crises’
214 impact.
215

216 **3. Study tenets**

217 The term ‘tenet’ is used in service sector research to refer to testable precepts dealing
218 with the identification of order in complex conditions (in this case with the chaordic
219 system), and as a result connected with complexity theory (Papatheodorou and
220 Pappas, 2016). As Wu et al. (2014) indicate, consistency metrics and statistical

hypotheses are not usually involved where outcome scores are being used to determine the adequacy of complex configurations. When dealing with the theory of configuration the same set of causal factors may lead to different outcomes, in terms of factor arrangement (Ordanini et al., 2014). This study evaluates the importance of attributes that affect the crisis resilience decision-making of Greek accommodation managers/owners, as highlighted by the relevant literature (Okumus and Karamustafa, 2005; Pearce II and Michael, 2006; Naidoo, 2010; Israeli et al., 2011; Pappas, 2015a, 2015b). As a result, the binary states (presence or absence) of aspects of decision-making by Greek hotels with regard to crisis resilience were evaluated. Along with the accommodation characteristics (category and accommodation type) the nine examined attributes were: operational costs, operational improvement, labour costs, marketing activities, innovation, competition, pricing policies, information technology, and cooperative initiatives. Table 1 presents the instability effects generated by crises events.

Please insert **Table 1**

The combination of several instability aspects generated by crises heavily affect business efficiency and productivity (Sintes, 2015). In addition, crises substantially influence enterprising aspects (i.e.: competitiveness, operations, innovation) (Paraskevas, 2006), generating complex conditions necessary to be examined (Ordanini et al., 2014). Based on the previous research of Olya and Altinay (2016) and Pappas (2017) in terms of tenets' formulation, the study created six tenets:

T1 – The same attribute can determine a different decision for accommodation managers/owners depending on its configuration/interaction with other attributes.

T2 – Recipe principle: When two or more simple conditions create a complex configuration, an outcome condition can have a consistently high score.

T3 – Complex interactions/configurations can affect the decision making of accommodation managers/owners.

T4 – Within different combinations the simple conditions of interactions/configurations can positively or negatively affect the decision making of accommodation managers/owners.

T5 – Equifinality principle: A sufficient decision-making for accommodation managers/owners is not always the result of a high outcome score.

T6: When the Y scores are high, a given recipe for the decision-making of accommodation managers/owners is not relevant for all cases.

Following the study of Pappas (2017), the confirmation criteria of tenets are as follow:

T1 – All nine simple conditions should appear in at least one sufficient configuration.

T2 – At least two out of nine simple conditions should appear in each generated solution.

T3 – Each sufficient configuration should provide a different pathway for crisis resilience.

T4 – None of the simple conditions should appear in all generated solutions.

T5 – fsQCA should provide a minimum of two generated solutions for crisis resilience.

T6 – There should be no generated solution with a coverage showcasing its application in all cases.

4. The Greek hotel industry and multiple crises

In recent years the Greek tourism and hospitality industry has had to face a series of major crises, placing crisis resilience at the forefront of its operations. The Greek economy entered into a recession in 2008 but the actual economic crisis fully unfolded in November 2009 (Polito and Wickens, 2012). This led to social unrest, and extensive budget cuts and austerity measures which have been the cause of frequent riots and demonstrations in all of the country's major cities, whilst numerous general strikes are declared every month (O'Grady, 2015; Smith, 2012). Recession and its devastating impact on social cohesion have heavily influenced the country's hotel industry, and even if tourist flows have increased due to peripheral crises in competitive destinations (i.e. the Arab spring, Lybian civil war, Syrian conflict, terrorist strikes in Turkey), there has been a sharp decline in tourism consumption and revenues (Pappas, 2015). The prolonged economic crisis has also taken its toll on the country's traditional political establishment, resulting in political instability. Within six years, the Greek people have called for the election of a new government five times (once in 2009; twice in 2012; twice in 2015), whilst the traditional governing political parties, those which have governed since 1974 (conservatives: Nea Dimokratia; socialists: PASOK) have been heavily defeated by the radical left (SYRIZA) (Ministry of Interior, 2016). In July 2015, negotiations between the new SYRIZA government and Greece's creditors led to a referendum for the acceptance or rejection of new austerity measures as part of a new memorandum. It resulted in the implementation of capital controls, the collapse of the Greek banking system, and

almost caused the country to leave the EMU (Ziotis et al., 2015). These developments have affected inbound tourist flows, reduced visitor expenditure patterns (Boyle, 2015) and resulted in the collapse of domestic tourism; nearly 80 percent of Greeks revealed, in 2016, that they were not planning to take a holiday (Greek Travel Pages, 2016). Bookings for journeys around the Greek islands have been reduced by 40 percent since 2010, and the hotel industry has been placed under considerable pressure (Foy, 2015).

As if the recession, social unrest, and political instability were not enough, Greece also had to cope with massive refugee flows. In 2015 more than 860,000 refugees entered Greece (UNHCR, 2016), mainly through the eastern Aegean sea islands, transforming a country of eleven million inhabitants into the main gateway for refugees fleeing into Europe from war and conflict zones such as Afghanistan, Iraq, and Syria, and crossing from Turkey by boat (European Commission, 2015). The combination of the refugee and the economic crises has resulted in an increase in unemployment and a decrease in human capital and entrepreneurial talent in the country, causing a further rise in unemployment (Halicioglou and Yolac, 2015). During 2015 the refugee crisis led within a year to a 40 percent decrease in inbound tourist arrivals and hotel reservations in the Eastern Aegean region. These figures for 2016 were expected to be considerably lower on several of the Eastern Aegean Sea islands (e.g. Chios, Lesvos, Samos) whose image, mainly amongst the 3S (Sea, Sun, Sand) tourists, has been damaged, whilst in other parts of the country tourism officials anticipate a significant increase in visitors (Angelopoulou and Roeder, 2016). However, 2016 was finally a recovery year for eastern Aegean islands with a considerable increase of visitors (Karageorgou, 2017), even if the two-years' forecasts

for 2016 and 2017 were indicating an average reduction of 40.63 per cent in overnights, 42.58 per cent in visitation, and 35.16 per cent in tourist revenues (Kousounis, 2017). All of the above highlight the complexity created by multiple crises for the Greek hotel business environment, since their operations are holistically characterised by a dynamic and complex set of aspects, based on unpredictability (chaos) and patterns (order). The Greek accommodation enterprises need to become resilient in crises within this chaordic system, as now discussed in the empirical research section of this paper.

5. Methods

5.1 Research characteristics

The research was conducted from July to September 2015 using questionnaires sent by email to Greek accommodation firms. There were four reasons for the selection of this particular time period: (i) it was during the peak tourist season when hotels are most likely to have to deal with potential crises; (ii) it was during the current Greek recession, in which the whole economy suffered, and tourism was perceived as the main sector that would bring the economic crisis to a close; (iii) it was just after a great financial crisis in Greece where capital controls had been implemented in banking transactions, and the possibility of Greece exiting the European Monetary Union (EMU) was stronger than at any other time; and (iv) it was the peak period of the refugee crisis where thousands of refugees were arriving daily in Greece from the Turkish Mediterranean coasts. All of the above created an uncertain and unstable political, financial, and business environment, where crisis management implementation was vital (Pappas, 2015a).

To select a sample frame, the following process was adopted. Due to the expected low rate of potential responses (email survey), more than 2,000 e-mails were sent with research questionnaires to Greek hotel firms. The respondents were owners/managers of hospitality firms operating in the country. The e-mail addresses were sourced from the Greek Travel Pages (www.gtp.gr).

5.2 Data collection and analysis

The questionnaire consisted of 56 Likert Scale (1 strongly disagree/5 strongly agree) statements. These statements were designed to assess hospitality owners'/managers' views toward operational costs (four statements adopted from Okumus and Karamustafa [2005]); operational improvement (four statements); labour costs (seven statements); marketing activities (four statements taken from Pearce II and Michael [2006]); innovation (six statements coming from the study of Naidoo [2010]); competition (eight statements adopted from [Pappas 2015a]); pricing policies; use of Information Technology (ten statements embedded from Doolin et al. [2002] and Pappas [2015b]); cooperative initiatives; and crisis resilience (five statements adopted from Okumus and Karamustafa [2005]). There were also two grouping questions concerning accommodation category and operational type. The levels of the two grouping variables were: for accommodation category, from 1 to 5 star hotels; and for operational type, annual or seasonal hotels. The grouping variables were drawn from the studies of Tso and Law (2005), Karagiorgas et al. (2007) and Pappas (2015a, 2015b). A linear presentation of the proposed model is illustrated in Figure 2.

Please insert **Figure 2**

Since the questionnaire was based on previous research, no extended pilot study (additional examination of statement validity and comprehension) was necessary. Instead, for pilot study purposes, 100 questionnaires were emailed resulting in the collection of 12 useful questionnaires (fully filled in questionnaires). The findings were used to identify any aspects which confused the respondents, or statements that were perceived as vague. No such aspects were identified. Therefore, those 12 questionnaires were retained in the main study. SPSS and Mplus was used for linear analysis, and STATA 2.5 for non-parametric.

The study employs fuzzy-set Qualitative Comparative Analysis (fsQCA) for the examination of complex configurations. fsQCA evaluates the interaction between different conditions of causality and outcome factors (Poorkavoos et al., 2016). More specifically, it examines possible relationships that have a bearing upon the outcome which is of interest, and any other possible binary set combinations generated from its predictors (Longest and Vaisey, 2008). This is considered to be a mixed-method technique, since it focuses on the combination of quantitative empirical testing (Longest and Vaisey, 2008) and qualitative inductive reasoning through case analysis (Ragin, 2000). The analysis is able to examine the chaordic perspective (logical complexity) as it is based on the fact that different characteristics' combinations might very well generate different results through their combination with other events or conditions (Kent and Argouslidis, 2005). As previously mentioned, the current tourism research is dominated by linear analysis, following a reductionist approach. Therefore, the research will also focus on the comparison of logical complexity with the dominant correlational analyses in tourism (regression; Cramer's V), evaluating the findings in terms of the extent they can highlight the spectrum of constructs'

importance, the pathway(s) that the hospitality industry can achieve crisis resilience, and the significance of research outputs. As proposed by Woodside and Zhang (2013), the study also examined negated sets (presence or absence of a given condition). In these sets, the calculation of a membership is made by taking in the original fuzzy-set one minus the score of membership of the examined case (Skarmeas et al., 2014). The absence of an attribute is indicated by the symbol "~".

As Ordanini et al. (2014) indicate, in set theory a sub relation with fuzzy measures is consistent when in a specific causal set of attributions the scores of membership are consistently less or equal to the scores of membership in the outcome set. The coverage entails the assessment of the configurations' sufficient empirical importance (Ordanini et al., 2014). Thus, coverage and consistency are calculated as:

$$Coverage(X_i \leq Y_i) = \sum_i [\min(X_i; Y_i)] / \sum_i (Y_i)$$

$$Consistency(X_i \leq Y_i) = \sum_i [\min(X_i; Y_i)] / \sum_i (X_i)$$

where, for accommodation manager/owner i, X_i is the membership score in the X configuration and Y_i is the membership score for the outcome condition.

Skarmeas et al. (2014) indicate that a general asymmetry between the respective relationships is present when the absolute values of all correlated coefficients are lower than .60. As illustrated in Table 2, all values are statistically significant and less than .60, therefore the causal conditions produced by the alternative combinations can lead to the same outcome condition (Woodside, 2013).

Please insert **Table 2**

As Ragin (2008) highlights, fsQCA can describe different factor combinations that exist among the comparable cases and result in higher incremental and radical performance. Using fsQCA, the research aims to evaluate the decision-making for crisis resilience of Greek accommodation managers/owners in a period characterised by multiple crises. Taking into consideration the accommodation category and operation type, this is achieved through the estimation of complex antecedent conditions (causal recipes) leading to high membership in the following conditions: (i) operational costs (ii) operational improvement (iii) labour costs (iv) marketing activities (v) innovation (vi) competition (vii) pricing policies (viii) information technology, and (ix) cooperative initiatives. The membership score of a recipe case is the membership degree to which simple causal conditions of fuzzy-sets intersect and include the recipe (Woodside and Zhang, 2013). In the causal recipe, this minimum score of intersection is between the selected simple conditions (Skarmeas et al., 2014). Through the complexity combination this study assumes that non-parametric (non-linear) relationships exist contrary to having Newtonian (linear) net effects.

Woodside (2014, p.2499) suggests that the non-linear consistency is analogous to the 'linear correlation metric', whilst the non-linear coverage metric is analogous to the linear 'coefficient of determination'. An acceptable and informative solution is when its coverage varies between .25 and .75 and the respective consistency is above .74 (Skarmeas et al., 2014).

6. Results

In total, the research includes 243 Greek accommodation establishments. Table 3 illustrates the sample numbers per category and operational type, compared with the total numbers of Greek hotels in the respective groups. Table 4 presents the results of the descriptive statistics.

Please insert **Table 3**

Please insert **Table 4**

For the evaluation of crisis resilience (f_cr) the calibrated fuzzy-sets used were named "f_oc" for operational costs; "f_oi" for operational improvement "f_lc" for labour costs; "f_ma" for marketing activities; "f_i" for innovation; "f_c" for competition; "f_pp" for pricing policies; "f_it" for information technology, and "f_ci" for cooperative initiatives. The grouping variables were named "f_at" for accommodation type; and "f_om" for operational mode. The symbol "*" was used for clearly separating the constructs, also indicating their inclusion in model evaluation.

6.1 Sufficient complex statements

fsQCA has generated five complex solutions (sufficient configurations including at least two out of nine examined simple conditions) as highlighted in Table 5.

Please insert **Table 5**

Following the research findings, the first sufficient configuration (f_at*f_om*~f_oc*f_oi*~f_lc*f_ma*f_i*f_c*~f_pp*f_it*f_ci) suggests that the inclusion of both grouping variables (accomodation category; operational mode) with

high operational improvement, marketing activities, innovation, competition, information technology, cooperative initiatives, low operation costs, low labour costs, and pricing policies is able to produce crisis resilient decision-making for accomodation providers. This solution appears to have the highest consistency (.873) of all five solutions, with .432 coverage. The second solution (f_at*f_om*f_oc*f_oi*~f_lc*~f_ma*f_i*~f_c*~f_pp*~f_it*~f_ci) indicates that the inclusion of both groups with high operational costs and improvement, innovation, low marketing activities, competition, labour costs, pricing policies, information technology, and cooperative initiatives can lead to high membership scores for hotel decision-making. This configuration generates the lowest coverage (.397) of all five solutions, whilst its consistency is .867. The third solution (~f_at*f_om*~f_oc*~f_oi*~f_lc*f_ma*f_i*f_c*~f_pp*f_it*~f_ci) includes operational mode with high marketing activities, innovation, competition, information technology, low operational and labour costs, operational improvement, pricing policies, and cooperative initiatives. Once more the membership was high (coverage: .455; consistency: .854). The fourth sufficient configuration (~f_at*~f_om*~f_oc*f_oi*~f_lc*~f_ma*f_i*f_c*f_pp*f_it*f_ci) suggests that when both grouping variables are excluded, a combination of high operational improvement, innovation, competition, pricing policies, information technology, cooperative initiatives, low operational and labour costs, and marketing activities can produce high scores (coverage: .413; consistency: .838) amongst crisis resilient accommodation decision-makers. The final (fifth) sufficient configuration (f_at*~f_om*f_oc*~f_oi*f_lc*~f_ma*~f_i*~f_c*f_pp*~f_it*~f_ci) appears to have the highest coverage (.482) and the lowest consistency (.811) of all the other solutions. It proposes that the inclusion of accommodation category with high

493 operational and labour costs, pricing policies, low operational improvement,
494 marketing activities, innovation, competition, information technology, and
495 cooperative initiatives can generate hotel decisions for crisis resilience. Overall, the
496 coverage is good (.446) and the solution consistency high (0.842). According to
497 Skarmeas et al. (2014), this result indicates an acceptable and informative solution.
498

499 **7. Discussion**

500 The research findings form the basis of an interesting discussion. The first sufficient
501 configuration indicates that the Greek accommodation providers try to deal with a
502 business environment characterised by multiple crises by focusing on the
503 development of enterprising competitiveness (high scores in: f_oi; f_ma; f_i; f_c; f_it;
504 f_ci). The aspects concerning the improvement of a company's operations,
505 innovation, use of information technology, and further cooperation networking, can
506 increase the crisis resilience of the firm. This finding is in agreement with previous
507 studies such as Papanond (2007), Racherla and Hu (2009) and Pappas (2015a)
508 highlighting the importance of enterprising competitiveness is periods of crisis and
509 extensive instability. A further contribution of this solution is that it also includes
510 marketing activities and competition, aspects that are directly connected with each
511 other, but are also highlighted from this configuration as important conditions for the
512 formulation of enterprising crisis resilience. The solution further suggests that the
513 extent of crisis resilience is based on the special characteristics of the company
514 (category; mode of operations), highlighting their importance, as also documented in
515 previous studies such as Tso and Law (2005), Karagiorgas et al. (2007), and Pappas
516 (2015b).
517

As in the first solution, the second solution also confirms the importance of both grouping variables for hotel decision-making during multiple crises. The focus of this sufficient configuration are the operational aspects of accommodation establishments (high scores in: f_oc; f_oi; f_i). This sufficient configuration deals with the decision-making process, meaning the activity of problem-solving, which leads to an optimal, or at least satisfactory solution (Triantaphyllou, 2000). The decision-making process of Greek hoteliers concerns the operational development and strengthening of their firms, since it includes the simple conditions of operational costs and improvement, and innovation. Innovative operations can strengthen the resilience of companies, an issue also highlighted by researchers such as Ros and Sintes (2012) and Falk (2013). During turmoil, most firms downsize their expenditures, including investment aspects and operational innovation, even though such actions may carry a risk (Archibugi et al., 2013). This configuration further contributes by highlighting the joint importance of operational costs and improvement, and innovation, aspects that if employed efficiently can lead to crisis resilience.

The orientation of the third sufficient configuration is towards marketing and promotional aspects, as it includes marketing activities, innovation, competition, and information technology (high scores in: f_ma; f_i; f_c; f_it). Several frameworks and models investigating the optimisation of marketing and the creation of competitiveness (i.e.: the extended Nerlove–Arrow model [Nerlove and Arrow, 1962], diffusion model [Krishan and Jain, 2006], advertising oscillators model [Zhang and Zheng, 2011]) have been formulated in the past. In difficult times, successful companies are willing to promote their business and prepare to exploit the anticipated recovery (Pearce II and Michael, 2006) by building the desirable competitive

advantage through innovative techniques (Naidoo, 2010). The findings further support the perceived importance and necessity of those actions on the part of the Greek hoteliers. In addition, the operational type of companies appears to influence this decision-making, something that supports the work of Karagiorgas et al. (2007). The results further highlight the perspective that through the joint innovative use of information technology and marketing, the enterprising competitiveness can be strengthened, and create a sufficient pathway for crisis resilience.

The fourth solution emphasises on business efficiency (the case in which a company or organisation can maximise profits and benefits with a parallel minimisation of expenditures and effort) with special reference to productivity. It embeds enterprising operations, information technology, innovative, competitive and cooperative initiatives, with the pricing policies of the products and services offered (high scores in: f_oi; f_i; f_c; f_pp; f_it; f_ci). The instability produced by crises jeopardies business efficiency and productivity aspects, since it heavily influences the operational ability, the competiveness, the innovation output, and the extent of enterprising cooperation (Sintes, 2015). As a result, demand fluctuations from crises lead tourism and hospitality companies to adjust their productivity and to make price adjustments (Wang, 2009). The findings indicate that the decision-making of Greek hoteliers takes into consideration the above aspects, whilst it further contributes to the understanding of productivity significance during periods of turmoil.

The last sufficient configuration suggests that the financial aspects of the accommodation establishments affect their decision-making. More specifically, it includes the simple conditions of operational and labour costs, and pricing policies

(high scores in: f_oc; f_lc; f_pp). As also suggested by Okumus and Karamustafa (2005), during crises hotels are likely to reduce costs through disruption to the normal operations and training of personnel, increased staff layoffs, and postponement of investments. In addition, the adjustment of pricing policies during a crisis seems inevitable, in an enterprising effort to maintain profitability and sustain market share (Falk and Hagsten, 2015; Seo et al., 2014). As the research indicates, the accommodation category influences the extent to which financial aspects affect the decision-making process. The importance of accommodation category is also suggested by studies such as Tso and Law (2005) and Stangl et al. (2016). The contribution of the fifth solution concerns the holistic focus on enterprising costs as an enterprising way to face turbulent time periods, as well as to further highlight the significance and strong interrelation of economic aspects (labour and operational costs; pricing policies).

7.1 Confirmation of tenets

As highlighted in Table 5, the coverage of the five solutions generated by fsQCA is high (.446). In addition, all nine examined simple conditions appear in at least one sufficient configuration. This means that each sufficient configuration includes a different combination of the examined simple conditions, even if all solutions finally lead to the same outcome. As a result, each attribute contributes differently to the decision-making in accordance with the overall combination of attributes in each condition. This finding leads to the confirmation of the first tenet (T1): The same attribute can determine a different decision for accommodation managers/owners depending on its configuration/interaction with other attributes.

All of the sufficient configurations presented in Table 5 include at least three attributes. More specifically, the first solution consists of operational improvement, marketing activities, innovation, competition, information technology, and cooperative initiatives (f_oi; f_ma; f_i; f_c; f_it; f_ci), the second one includes operational costs and improvement, and innovation (f_oc; f_oi; f_i), the third sufficient configuration embeds marketing activities, innovation, competition, and information technology (f_ma; f_i; f_c; f_it), the fourth solution has operational improvement, innovation, competition, pricing policies, information technology, and cooperative initiatives (f_oi; f_i; f_c; f_pp; f_it; f_ci), and the last (fifth) one consists of operational and labour costs, and pricing policies (f_oc; f_lc; f_pp). This means that each generated recipe includes at least two simple conditions in order to lead to the desired outcome. This finding is also highlighted in previous studies, such as Woodside (2014) and Olya and Altinay (2016), and confirms the second tenet (T2): Recipe principle: When two or more simple conditions create a complex configuration, an outcome condition can have a consistently high score.

Since fsQCA is based on cases instead of variables, when employed, the generated solutions concern: (i) an outcome dealing with the combination of the related variables, and (ii) the association of the groups of variables within the combination (Ordanini et al., 2014). As previously highlighted, the first sufficient configuration concerns the development of enterprising competitiveness, the second one the operational aspects of Greek hotels, the third solution the marketing and promotional issues, the fourth configuration the business efficiency and productivity, and the fifth one the financial aspects. This means that each generated solution is actually a complex interaction of specific simple conditions, having an impact on the final

outcome. These findings provide sufficient grounds for the confirmation of the third tenet (T3): Complex interactions/configurations can affect the decision making of accommodation managers/owners.

The study employed contrarian case analysis (inclusion/exclusion of attributes). For example, even if a simple condition appears in at least one solution, none of them appears in all sufficient configurations. Therefore, the extent to which a simple condition is present or absent determines its positive or negative influence on crisis resilience for Greek hoteliers. This confirms the fourth tenet (T4): Within different combinations the simple conditions of interactions/configurations can positively or negatively affect the decision making of accommodation managers/owners.

As highlighted by Woodside (2014, p.2499), “The occurrences of different paths usually do not occur with the same frequency among the set of paths”. The equifinality principle indicates that multiple paths may lead to the same outcome. The outcome scores illustrated in Table 5 are not actually high. As a result, the findings showcase that there are many different ways (in this case five) of achieving the desired outcome. Therefore, the fifth tenet is confirmed (T5): Equifinality principle: A sufficient decision-making for accommodation managers/owners is not always the result of a high outcome score.

As highlighted in Table 5, the coverage of the sufficient configurations varies from .397 to .482. This result suggests that none of the five solutions applies in all cases (Olya and Altinay, 2016). It is evident that each generated solution only covers a part of the examined population, whilst the sum of sufficient configurations substantially

643 covers the respondents' population. This leads to the confirmation of the sixth tenet
644 (T6): When the Y scores are high, a given recipe for the decision-making of
645 accommodation managers/owners is not relevant for all cases.
646
647 *7.2 Fit and predictive validity*
648 Most researchers dealing with model examination employ model fit (Gigerenzer and
649 Brighton, 2009), aiming to ensure that the data can create the basis for the
650 relationships amongst the factors and the observed variables (Pappas, 2015b),
651 including methods such as sequential, curve, or goodness of fit. As a result, only a
652 handful of studies implement predictive validity (Papatheodorou and Pappas, 2017;
653 Wu et al., 2014), suggesting that a sufficient model is not necessarily dependent on
654 the observations of a relevant good fit (Gigerenzer and Brighton, 2009). This study
655 proceeds from fit to predictive validity for the examined models, and follows the
656 process described by Wu et al. (2014), and Olya and Altinay (2016). The research
657 divided the sample into two equal parts, a holdout and a modelling subsample, to test
658 the theory that the patterns of hotel decision-making are consistent indicators for high
659 score generation. The modelling subsample was used for the examination of the
660 configural models of the holdout sample. The algorithm combination of the holdout
661 sample was similar to the results from fsQCA in all the sample. Finally, the holdout
662 sample was examined using the modelling subsample. The overall consistency was
663 .807 (C1>.74) and the coverage was .416 (.75>C2>.25). The findings suggest that the
664 model has good predictive validity.
665
666
667

7.3 fsQCA vs correlational analysis

Taking into consideration the determination of the relationships between the constructs of the model, and the multivariate nature of the linear model (Figure 2), Structural Equation Modelling (SEM) was employed. The complete structural model was examined for the determination of structural model fit, and the identification of causal relationships among the constructs. The probability of the χ^2 statistic is the most common measure of SEM fit (Martens, 2005), which should be non-significant in a good fitting model (Hallak et al., 2012). Since the research sample was large (N=243), the χ^2 ratio divided by the degrees of freedom (χ^2/df) was perceived to be a better goodness-of-fit estimate than χ^2 (Chen and Chai, 2007). Kline (2010) indicates that, from a choice of several indices, four of them (χ^2, the Comparative Fit Index [CFI], Root-Mean-Square Error of Approximation [RMSEA], and Standardised Root-Mean-Square Residual [SRMR]) are the most appropriate for the evaluation and examination of model fit. The model fit is as follows: χ^2=328.211, df=186, χ^2/df=1.765 [acceptable value $0 \leq \chi^2/df \leq 2$ (Schermelleh-Engel et al., 2003)], CFI=.928 [acceptable value is when CFI is close to 1.0 (Weston and Gore, 2006)], RMSEA=.044 [acceptable value is when RMSEA<.5 (Browne and Cudeck, 1993)], and SRMR=.72 [acceptable value is when SRMR<.8 (Hu and Bentler, 1999)].

The study used factor analysis to focus on the important components of the research. In order to evaluate higher coefficients, absolute values of less than .4 were suppressed, since this is the minimum acceptable value (Norman and Streiner, 2008). According to the correlation matrices, out of 56 statements, 43 scored more than .4, whilst 13 did not. The KMO of Sampling Adequacy was 0.827 (higher than the minimum requested 0.6 for further analysis), whilst statistical significance also

existed ($p<.01$). In order to examine whether several items that propose to measure the same general construct produce similar scores (internal consistency), the research also made an analysis using Cronbach's Alpha, where the overall reliability was .882, and all variables scored over .8 (minimum value .7; Nunnally, 1978). The loadings of factor analysis are presented in Table 6.

Please insert **Table 6**

The research model explained the endogenous variables of the study: operational costs (R^2=.077), operational improvement (R^2=.432), marketing activities (R^2=.573), innovation (R^2=.754), labour costs (R^2=.305), pricing policies (R^2=.345), use of Information Technology (R2=.340), cooperative initiatives (R^2=.400), competition issues (R^2=.521), and crisis resilience (R^2=.594). As highlighted in Figure 2, the results confirmed most linear relationships. With regard to the grouping variables (accommodation type; operational mode), they seem to have a considerable effect upon the Greek hotel industry. The endogenous variables are illustrated in Figure 3.

Please insert **Figure 3**

Following the examination process highlighted in the studies of Ordanini et al. (2014) Pappas (2017), and Pappas and Papatheodorou (2017), the comparison between SEM and fsQCA indicates the appropriateness of fsQCA in examining aspects of complexity in chaordic systems. The evaluation of results is based on the extent the findings can highlight the full spectrum of the constructs' importance, the pathway(s) that crisis resilience can be achieved, and the generated significance of research

718 outputs. To begin with, regression limits itself to the consideration of a single
719 pathway, i.e. the joint linear direct effect of all the examined constructs on
720 accommodation managers'/owners' decision-making. This highlights regression's
721 inability to encapsulate the full range of different combinations and influences able to
722 produce the same outcome, something that is an inherent feature of complexity in the
723 decision-making process. For example, whilst the fourth sufficient configuration
724 generated by fsQCA and presented in Table 5,
725 (~f_at*~f_om*~f_oc*f_oi*~f_lc*~f_ma*f_i*f_c*f_pp*f_it*f_ci) highlights the
726 decision-making pathway for accomodation managers/owners to face multiple crises,
727 it does not involve operational and labour costs, as well as marketing activities, as
728 required by SEM. In addition, it is the fsQCA generated solution that excludes both
729 grouping questions (accomodation category; operation type), whilst in SEM the
730 decision-making of the Greek hotel industry appears to be dependent on those two
731 aspects. Moreover, SEM suggests that the constructs dealing with operational
732 improvement, labour costs and pricing policies do not impact on crisis resilience
733 decision-making. Conversely, all three constructs are included in at least one
734 sufficient configuration (operational improvement: solutions 1,2,4; labour costs:
735 solution 5; pricing policies: solutions 4,5) produced by fsQCA.
736
737 In addition to regression, the study implemented Cramer's V test. According to Burns
738 and Burns (2008), Cramer's V varies from 0 (no association) to 1 (complete
739 association). The results indicate that wherever Cramer's V tests produce a statistical
740 significance ($p<.05$), the effect size is moderate to strong. This effect size varies
741 from .238 (moderate/acceptable: $.20<V<.25$) to .312 (strong/acceptable: $.30<V<.35$).
742 Conversely, in the cases concerning operational costs, operational improvement, and

743 labour costs Cramer's V was not statistically significant. So fsQCA appears also to be
744 more efficient than Cramer's V, since it better illustrates the influence of the
745 examined constructs on crisis resilience decisions made by hotels. The results of
746 Cramer's V tests are presented in Table 7.
747
748 Please insert **Table 7**
749
750 *7.4 Managerial implications*
751 The study presents the complexity of Greek hoteliers' decision-making within a
752 chaordic system generated by multiple crises. Moreover, it highlights the importance
753 of fsQCA when evaluating these complex conditions. The findings reveal five
754 sufficient configurations dealing with the decision-making of accommodation
755 providers. These solutions focus on: (i) the development of enterprising
756 competitiveness, (ii) the operational aspects of Greek hotels, (iii) the marketing and
757 promotional issues, (iv) the business productivity and efficiency, and (v) the financial
758 aspects of hotels. The findings can assist accommodation providers and destinations
759 to further comprehend the complex conditions generated by crises, and the decision-
760 making of managers/owners in chaordic systems. For example, if a hotel perceives
761 that the best way to tackle the effects of these crises is to focus on more aggressive
762 marketing due to sharp decline of reservations (maybe because it is situated in one of
763 the eastern Aegean islands and mostly affected by the refugee crisis), then it will most
764 likely want to focus on the third solution (marketing and promotional issues).
765 Conversely, if the hotel faces price competition due to the extensive development of
766 sharing economy (i.e.: enterprises situated in Athens), the fifth solution maybe the
767 most versatile to follow. Paraskevas et al. (2013) pinpoints the importance to tourism

industry practitioners of better comprehension of the elements, processes and conditions required for the development of appropriate enterprising strategies during crises.

Apart from the confirmation of findings generated from previous studies, the current research contributes in several aspects. First, it discusses the close relation of marketing and competition, highlighting their importance for the formulation of enterprising competitive advantage. As it is also documented in the study of Pappas and Papatheodorou (2017), Greek hotels sharply decrease marketing budgets in order to tackle crisis effects. However, a strong competitive advantage can lead the company to better perform and easier exit crisis conditions. It further illustrates the joint importance of operational improvement, operational costs, and innovation, and their ability to lead to crisis resilience. Moreover, it suggests that the joint innovative use of marketing and information technology, can increase the competitiveness of a company, making it resilient to crises. This is also connected with the overall competitiveness of the Greek hospitality industry, especially during this transitional period where it has to consider the effects of multiple crises. In addition, it helps us further understand the significance of productivity in periods of high business instability. Finally, it provides a spherical perspective on the importance of the different (still strongly related) economic aspects of operational and labour costs, and pricing policies. Therefore, this study is also a tool to help hoteliers to understand the effects of crises on accommodation establishments, the operational impact of supply and demand transformation, and the need for enterprises to focus on achieving crisis resilience.

In terms of decision-making, fsQCA can help to clarify complexity in chaordic systems. Its ability to generate multiple solutions expressing different business interests and desirable enterprising strategies can assist hoteliers to take better decisions by improving their insight in an increasingly unstable business environment. In terms of the Greek accommodation establishments, fsQCA can provide the means to further clarify their strategies in terms of the crisis it affects them most, the special characteristics of the enterprise and the particulars of the external environment they have to operate. The study also highlights the disadvantages of conventional linear analysis by comparing fsQCA with regression and Cramer's V. The research presents the importance of innovation (it appears in four out of five solutions) for crisis resilience, whilst it suggests that an appropriate combination of attributes can lead hotels to make good decisions, even when some of the studied aspects are missing. It is more than likely that in the future there will be periods of marked instability triggered by a combination of multiple crises, and that chaordic patterns will reshape the dynamics of global tourism and hospitality (Papathodorou and Pappas, 2016). Thus, operational improvements, competition, the use of information technology (included in three solutions), and cooperative initiatives (included in two solutions) should be prioritised by accommodation managers/owners.

Multiple crises, the rapid transformation of the business environment, and the chaordic perspective on tourism decisions all have an inevitable influence upon business decision-making. The complexity of these chaordic systems needs to be further evaluated by destinations and their hotels. fsQCA can provide the grounds for further understanding of decision-making by both tourists and stakeholders. The ability of companies to sufficiently implement environmental scanning and identify

818 the signals relevant to them is crucial for their survival, especially during a period of
819 crisis (Paraskevas and Altinay, 2013). Concerning Greek hotels, a further
820 understanding of the complex environment they operate can assist them to more
821 sufficiently focus on the market share of their interest (i.e.: domestic tourism; business
822 travellers; leisure holidaymakers), and better operate in an increasingly competitive
823 and more demanding scenery (evaluation of multiple crises' effects; identification of
824 opportunities from other crises in competitive destinations [i.e.: Arab spring; terrorist
825 strikes in France, Turkey and Tunisia]). In addition, it is important for tourism and
826 hospitality companies to identify potential alternative strategies which might
827 strengthen their crisis resilience and ensure their continued operation in the
828 competitive market. The five solutions produced by the research highlight the
829 dependency of accommodation providers' decision-making on the individual
830 characteristics of respondents and companies, as well as on those characteristics in
831 combination. Therefore, fsQCA can be perceived as the appropriate method for
832 examining these characteristics, and the high levels of complexity which exist in
833 chaordic conditions.
834
835 **8. Conclusions**
836 This research has focused on the decision-making of Greek accommodation providers
837 within a charodic system which is affected by multiple crises. In the theoretical
838 domain, its contribution lies in the provision of a better understanding of the complex
839 tourism-crisis relationship and its implications for decision-making with regard to
840 tourism accommodation. Methodologically, the study contributes through the
841 implementation of fsQCA, which is regarded as an innovative tool in tourism and
842 hospitality studies and the service sector more generally. Moreover, it highlights the

suitability of nonlinear research in tourism when compared to the dominant correlational analyses (regression and Cramer's V), and progresses from fit to predictive validity for the proposed models.

Despite the theoretical and methodological contribution of the research, it is necessary to highlight a number of limitations. Although the use of fsQCA is the main methodological strength of the work, it is also its first limitation, since only a handful of studies have employed it in the service sector (Wu et al., 2014) and it is new in the tourism and hospitality domain (Papatheodorou and Pappas, 2016). As a result, its full potential has yet to be realised, creating the necessity for further examination in multiple tourism and hospitality chaordic contexts. A second limitation derives from the fact that examination and/or inclusion of other attributes might generate different outcomes. Therefore, any generalisation of the provided sufficient configurations should be made with caution. A third limitation stems from the special/unique characteristics of the Greek hotel industry. A repetition of this research in a different business environment facing different chaordic systems may generate different results, and their comparison could produce useful insights for the decision-making of accommodation establishments. Finally, the research only examines the perspectives of Greek hotel managers/owners. A comparison between these people and the tourists (including their socio-demographic characteristics) who select Greece for their holidays, alongside an appreciation of the decision-making processes of destination authorities, would assist our further understanding of supply and demand.

The ability of fsQCA to generate sufficient solutions able to propose different pathways leading to the same outcome, can be implemented along with other

methodologies such as conjoint analysis. In addition, fsQCA can enable us to further comprehend the influential factors of decision-making in tourism and hospitality, like changing market dynamics, the formulation of supply and demand, and operational flexibility and adaptability in new environments. Those aspects create the research grounds for further growth of fsQCA in tourism and hospitality.

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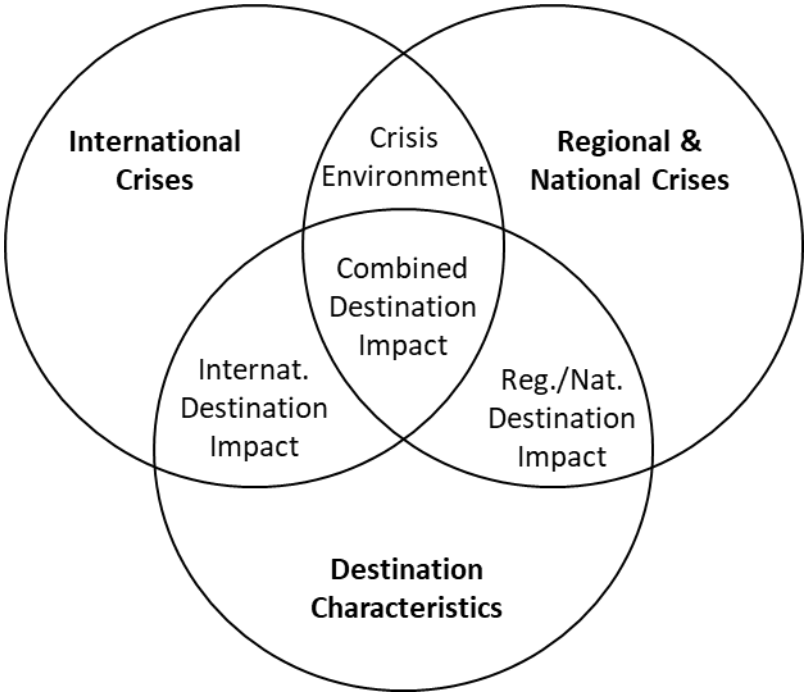
1212 Figure 1: Effect of crises in tourism destinations



1213

1214 Table 1: Instability effects generated by crises

Effects	Indicative Previous Studies
Business efficiency	Pearce II and Michael (2006); Olthetena, Sougiannis, Travlos and Zarkos (2013)
Productivity aspects	Mar-Molinero, Menéndez-Plans and Orgaz-Guerrero (2017); Yépez (2017)
Operational ability	Akrivos, Reklitis and Theodoroyiani (2014); Epstein, Shapiro and Gómez (2017)
Competiveness	Cirstea (2014); Pappas (2015a)
Innovation output	García-Pozo, Sanchez-Ollero, and Ons-Cappa (2016) Naidoo (2010)
Enterprising cooperation	Okumus and Karamustafa (2005); Voltes-Dorta, Rodríguez-Deniz and Suau-Sanchez (2017)

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1217 Figure 2: The proposed model

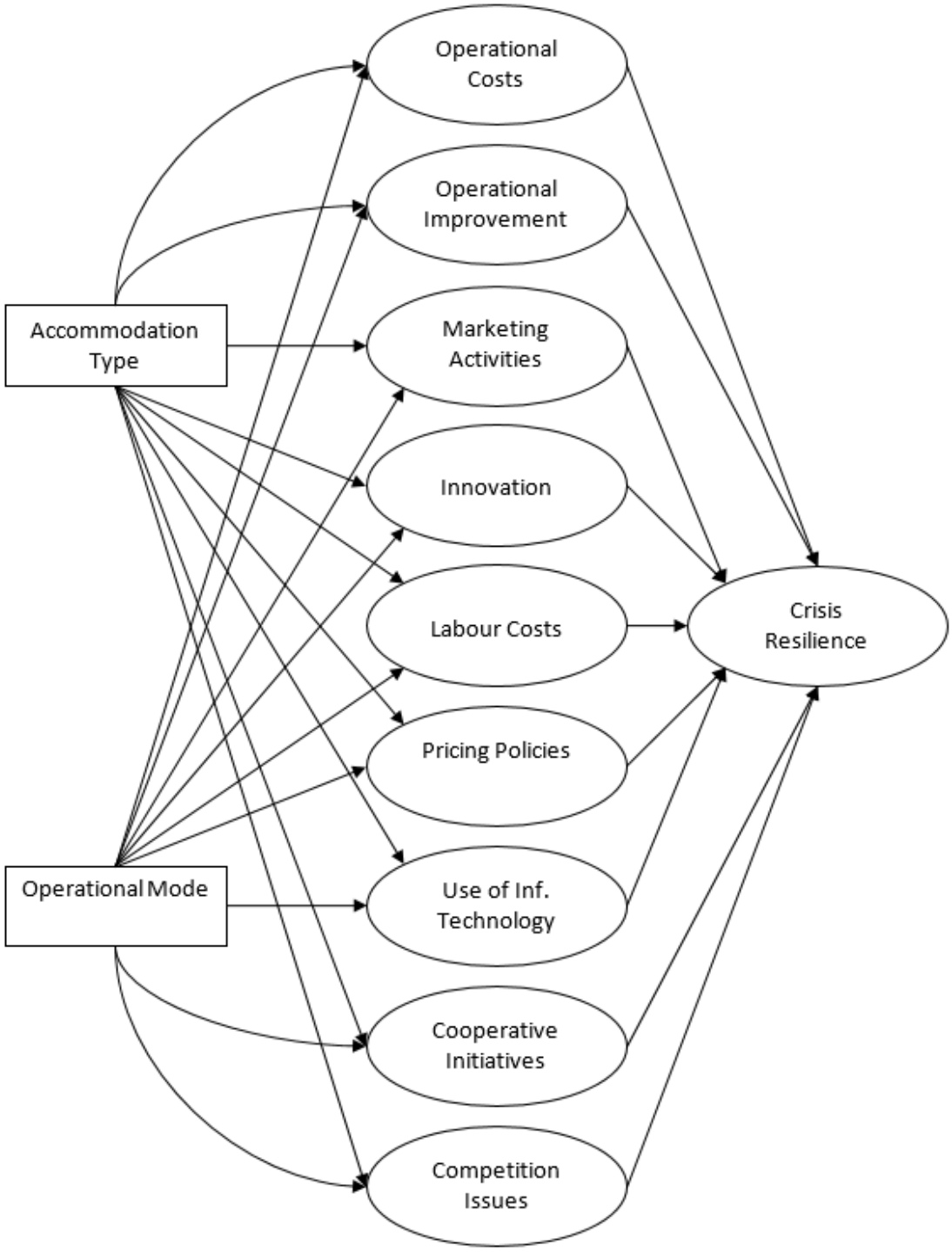

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Table 2: Correlation matrix

		1	2	3	4	5	6	7	8	9	10
1	Operational Costs	1									
2	Operational Improvement	.190	1								
3	Labour Costs	.172	.290	1							
4	Marketing Activities	.194	.359	.327	1						
5	Innovation	.259	.526	.536	.554	1					
6	Competition	.197	.455	.395	.504	.500	1				
7	Pricing Policies	.173	.228	.436	.399	.558	.458	1			
8	Information Technology	.191	.272	.328	.440	.485	.375	.444	1		
9	Cooperative Initiatives	.205	.282	.378	.498	.533	.407	.464	.355	1	
10	Crisis Resilience	.224	.266	.347	.426	.441	.381	.362	.222	.523	1

All correlations are significant at .01 level

1225 Table 3: Hotel characteristics

	Sample		**Actual (2016)***	
Category	N	%	N	%
5*	17	7	444	4.6
4*	47	19.3	1412	14.5
3*	63	25.9	2472	25.4
2*	84	34.6	3990	41
1*	31	12.8	1412	14.5
N/A	1	0.4	-	-
Total	243	100	9730	100
Operational mode				
Seasonal	164	67.4	5245	53.9
Annual	78	32.1	4485	46.1
N/A	1	0.4	-	-

1226

1227 *Source: Elstat (2017)

1228

1229 Table 4: Descriptive statistics

	Establishment's Star Category						*Operational Mode*				
	Total	5*	4*	3*	2*	1*	Total	Annual	Seasonal	Skewness	Kurtosis
Operational Costs											
OC1	3.54	4.12	4.02	3.56	3.35	2.97	3.54	3.76	3.43	-.378	.084
OC2	3.70	4.71	4.36	3.68	3.19	3.59	3.70	3.85	3.64	-.401	-.248
OC3	2.96	3.12	2.98	3.32	2.88	2.37	2.96	3.04	2.93	-.275	-.380
OC4	3.49	2.53	2.94	3.56	3.74	4.03	3.49	3.37	3.55	-.178	-.311
Operational Improvement											
OI1	2.70	3.53	3.45	2.60	2.33	2.34	2.70	3.46	2.35	.212	-.663
OI2	3.42	3.59	3.62	3.46	3.51	2.75	3.42	4.10	3.10	-.289	-.816
OI3	2.79	2.41	2.36	2.81	3.00	3.03	2.79	2.55	2.90	.224	-.912
OI4	2.23	2.41	2.11	2.22	2.30	2.13	2.23	2.31	2.19	.968	1.583
Labour Costs											
LC1	2.75	2.88	3.23	2.86	2.61	2.16	2.75	2.29	2.97	.140	-.833
LC2	3.55	4.18	3.98	3.46	3.44	3.06	3.55	3.68	3.49	-.699	.804
LC3	2.85	3.18	2.98	3.10	2.69	2.42	2.85	2.97	2.79	-.046	.032
LC4	3.40	4.24	4.32	3.97	2.74	2.22	3.40	3.46	3.37	-.372	-.649
LC5	4.51	4.35	4.45	4.49	4.55	4.62	4.51	4.62	4.46	-.537	.111
LC6	3.62	3.53	3.64	3.95	3.54	3.19	3.62	3.58	3.63	-.007	-.209
LC7	2.66	2.65	2.98	2.67	2.65	2.22	2.66	2.69	2.65	.291	-.273
Marketing Activities											
MA1	2.37	3.53	2.91	2.25	2.10	1.91	2.37	2.74	2.19	.764	.444
MA2	2.60	3.47	3.17	2.76	2.23	2.00	2.60	2.77	2.53	.354	-.194
MA3	3.42	4.06	3.65	3.32	3.51	2.70	3.42	3.50	3.39	-.427	-.318
MA4	2.24	3.24	3.00	2.40	1.76	1.56	2.24	2.50	2.12	.290	-.626
Innovation											
I1	2.95	4.12	3.70	3.05	2.52	2.12	2.95	3.73	2.58	-.122	-.841
I2	3.01	3.76	3.26	3.57	2.76	1.81	3.01	3.22	2.92	-.315	-.523
I3	3.11	3.88	3.66	3.19	2.83	2.47	3.11	3.49	2.93	-.151	-.492
I4	3.41	3.88	3.91	3.63	3.07	2.84	3.41	3.58	3.33	-.085	-.432
I5	2.81	3.59	3.28	2.94	2.49	2.31	2.81	3.51	2.48	-.024	-.834
I6	1.95	2.94	2.79	1.89	1.61	1.16	1.95	2.08	1.88	.532	-.403
Competition											
C1	2.83	3.12	3.15	3.05	2.45	2.75	2.83	2.96	2.76	.308	-.712
C2	2.82	4.12	3.96	2.79	2.21	2.09	2.82	2.85	2.81	.418	-.669
C3	2.85	3.59	3.19	2.98	2.54	2.50	2.85	3.87	2.36	.161	-.885

C4	2.07	2.35	2.13	2.16	1.95	1.87	2.07	2.13	2.04	1.132	2.139
C5	4.21	4.53	4.36	4.30	3.96	4.25	4.21	4.32	4.15	-.484	.883
C6	4.10	4.00	3.83	4.22	4.10	4.34	4.10	4.09	4.11	-.802	2.335
C7	2.55	2.53	2.28	2.65	2.48	2.97	2.55	2.58	2.54	.532	-.318
C8	2.10	2.12	2.02	2.19	2.11	1.97	2.10	2.04	2.12	1.026	2.182
Pricing Policies											
PP1	3.12	2.94	3.13	3.12	3.05	3.22	3.12	3.15	3.10	-.094	-.346
PP2	2.71	3.35	3.53	2.89	2.33	1.78	2.71	2.81	2.66	.207	-.218
PP3	1.83	2.35	2.60	1.75	1.39	1.72	1.83	2.03	1.73	1.182	1.932
PP4	3.32	3.53	3.36	3.21	3.39	3.19	3.32	2.88	3.53	-.152	-.539
Use of Information Technology											
IT1	3.62	4.41	4.11	3.56	3.36	3.12	3.62	3.78	3.54	-.169	-.660
IT2	3.75	4.18	3.96	3.89	3.60	3.28	3.75	3.92	3.66	-.099	-.228
IT3	3.21	3.94	4.02	3.27	2.82	2.48	3.21	3.35	3.15	-.181	-.725
IT4	2.96	3.59	3.68	3.03	2.61	2.24	2.96	3.05	2.91	.040	-.892
IT5	4.17	4.88	4.70	4.27	3.87	3.52	4.17	4.31	4.10	-.822	.719
IT6	3.92	4.41	4.45	3.83	3.60	3.90	3.92	4.03	3.87	-.929	.463
IT7	3.88	4.53	4.11	3.52	3.99	3.59	3.88	4.00	3.82	-.420	.222
IT8	3.21	4.00	3.21	2.81	3.31	3.28	3.21	3.24	3.19	-.423	-.644
IT9	4.06	4.59	4.40	3.90	3.99	3.78	4.06	4.14	4.02	-.505	-.487
IT10	3.95	4.41	4.28	3.67	3.93	3.86	3.95	4.09	3.89	-.375	-.022
Cooperative Initiatives											
CI1	3.21	3.88	3.60	3.49	2.87	2.66	3.21	3.41	3.12	-.312	-.237
CI2	3.02	3.71	3.53	3.33	2.69	2.16	3.02	3.15	2.96	-.173	-.609
CI3	2.77	4.12	3.64	2.87	2.15	2.22	2.77	3.19	2.58	.036	-.862
CI4	2.65	3.12	3.43	2.52	2.51	1.84	2.65	2.78	2.58	.281	-.643
Crisis Resilience											
CR1	4.45	4.41	4.55	4.52	4.40	4.28	4.45	4.46	4.44	-1.507	2.563
CR2	3.00	3.71	3.43	3.16	2.70	2.44	3.00	3.50	2.76	.137	-.664
CR3	4.32	4.12	4.51	4.44	4.25	4.09	4.32	4.36	4.30	-1.076	1.087
CR4	3.84	4.12	4.51	4.44	3.24	3.12	3.84	3.90	3.82	-.455	-1.065
CR5	3.36	3.94	3.81	3.60	3.02	2.81	3.36	3.54	3.28	-.178	-.427

Explanation of Abbreviations: OC: Operational costs; OI: Operational improvement; LC: Labour costs; MA: Marketing activities; I: Innovation; C: Competition; PP: Pricing Policies; IT: Use of Information Technology; CI: Cooperative Initiatives; CR: Crisis resilience

Table 5: Complex solutions on operational decisions

Complex Solution	Raw Coverage	Unique Coverage	Consistency
Model: f_cr=f(f_at,f_om,f_oc,f_oi,f_lc,f_ma,f_i,f_c,f_pp,f_it,f_ci)			
f_at*f_om*~f_oc*f_oi*~f_lc*f_ma*f_i*f_c*~f_pp*f_it*f_ci	0.432	0.125	0.873
f_at*f_om*f_oc*f_oi*~f_lc*~f_ma*f_i*~f_c*~f_pp*~f_it*~f_ci	0.397	0.130	0.867
~f_at*f_om*~f_oc*~f_oi*~f_lc*f_ma*f_i*f_c*~f_pp*f_it*~f_ci	0.455	0.123	0.854
~f_at*~f_om*~f_oc*f_oi*~f_lc*~f_ma*f_i*f_c*f_pp*f_it*f_ci	0.413	0.109	0.838
f_at*~f_om*f_oc*~f_oi*f_lc*~f_ma*~f_i*~f_c*f_pp*~f_it*~f_ci	0.482	0.118	0.811
Solution Coverage: 0.446 Solution Consistency: 0.842			

1237 Table 6: Cronbach A and factor loadings

Statements	*A*	*Loadings*
Operational Costs	.882	
OC1: We renegotiated bank credits		.436
OC2: We renegotiated the prices or payment conditions with suppliers		.559
OC3: We renegotiated the prices or payment conditions with customers (other organisations)		**.357**
OC4: We postponed new investments		-.480
Operational Improvement	.882	
OI1: We created or improved our loyalty program		.551
OI2: We increased answering speed		.457
OI3: We reduced direct client services		**.323**
OI4: We reduced back-office services		.520
Labour Costs	.880	
LC1: We laid off employees to reduce labour force		**-.348**
LC2: We used unpaid vacation to reduce labour force		**.367**
LC3: We reduced the number of workdays/hours per week		.431
LC4: We make stronger collaboration with the university to develop internship program		.694
LC5: We frozen pay rates		-.454
LC6: When and where possible we replaced highly paid employees with low-paid employees		.436
LC7: We increased our reliance on outsourcing		**.229**
Marketing Activities	.878	
MA1: We maintained or increased our spending on advertising		.525
MA2: We entered new market segments		.561
MA3: We improved product promotional activities		-.416
MA4: We reduced our budget to be allocated to corporate social responsibility		.682
Innovation	.877	
I1: We introduced new products and services		.707
I2: We implemented innovative pricing strategies		.547
I3: We adopted new and innovative marketing strategies		.517
I4: We improved product placement		.510
I5: We improved product pricing		.548
I6: We invested mainly in large projects in order to realize economies of scale		.680
Competition	.881	
C1: We tried to force competitors out of the market by good cost control		.420
C2: We opened our business to new international markets		.667
C3: We opened our business to new market segments		.488
C4: We repositioned our offer in specific/limited market segments		**-.360**
C5: We decided to adopt a competitive strategy based on the continuous improvement of quality standards of our offer product and services		**.288**
C6: We selected our distribution channels mainly adopting a cost-driven decision		**.208**
C7: We focused on producing and delivering a limited range of products and services		**-.357**
C8: We benchmarked our competitors and tried to imitate their strategies		**.324**
Pricing Policies	.881	
PP1: We explored and found alternatives to budget costs		.459

PP2: We reduced our budget for training our employees		.649
PP3: We created awards from employee's ideas to reduce costs and/or to increase sales		.542
PP4: We reduced the prices used to sell rooms		**-.249**
Information Technology	.880	
IT1: In our official website, we decided to use systematic links to further information		.446
IT2: We decided to use multiple value-added features (key facts, maps, itineraries, distances, news, photo gallery, GPS, etc)		**.393**
IT3: In our official website, we decided to use interactive value-added features (currency converters, electronic postcards, interactive maps, guest books, Web cam, etc)		.605
IT4: In our official website, we decided to use online customer service and support (FAQs, site map, site search engine, chat, skype, avatar, etc)		.500
IT5: In our official website, we decided to use booking engine to guarantee online bookings		.591
IT6: In our official website, we decided to use secure online payment (e.g. PayPal)		**.351**
IT7: We increased the use of social media in our marketing and promotion strategy		.748
IT8: We increase the use of social media to make competitive analysis and to know more about our competitors		.512
IT9: We increased the use of social media to better know customers' needs and desires		.557
IT10: We make an effort to properly answering to positive and negative comments uploaded online		.718
Cooperative Initiatives	.877	
CI1: We entered into strategic partnership and alliances with other companies to offer joint services		.631
CI2: We entered strategic partnership and alliances to make co-marketing activities		.639
CI3: We entered strategic alliances with other companies to jointly manage the buying process of product and services (gasoil, official materials etc) with the aim of exploiting economies of scale		.689
CI4: We entered into tourism consortia		.431
Crisis Resilience	.880	
CR1: We reduced costs		.699
CR2: We increased marketing efforts		.486
CR3: We prepared and adopted crisis plans		.688
CR4: We improved product design		.533
CR5: We decided to make partnership and collaboration with other businesses		.578

Loadings in bold are excluded due to low commonality (<.04)

1240 Table 7: Cramer's V tests

	χ^2	Cramer's V	Sig.
Crisis Resilience*Operational Costs	108.450	.237	.363
Crisis Resilience*Operational Improvement	116.357	.231	.720
Crisis Resilience*Labour Costs	127.235	.258	.154
Crisis Resilience*Marketing Activities	218.891	.276	.005
Crisis Resilience*Innovation	272.014	.283	.004
Crisis Resilience*Competition	138.188	.238	.000
Crisis Resilience*Pricing Policies	163.891	.274	.013
Crisis Resilience*Information Technology	313.907	.312	.005
Crisis Resilience*Cooperative Initiatives	326.601	.310	.000

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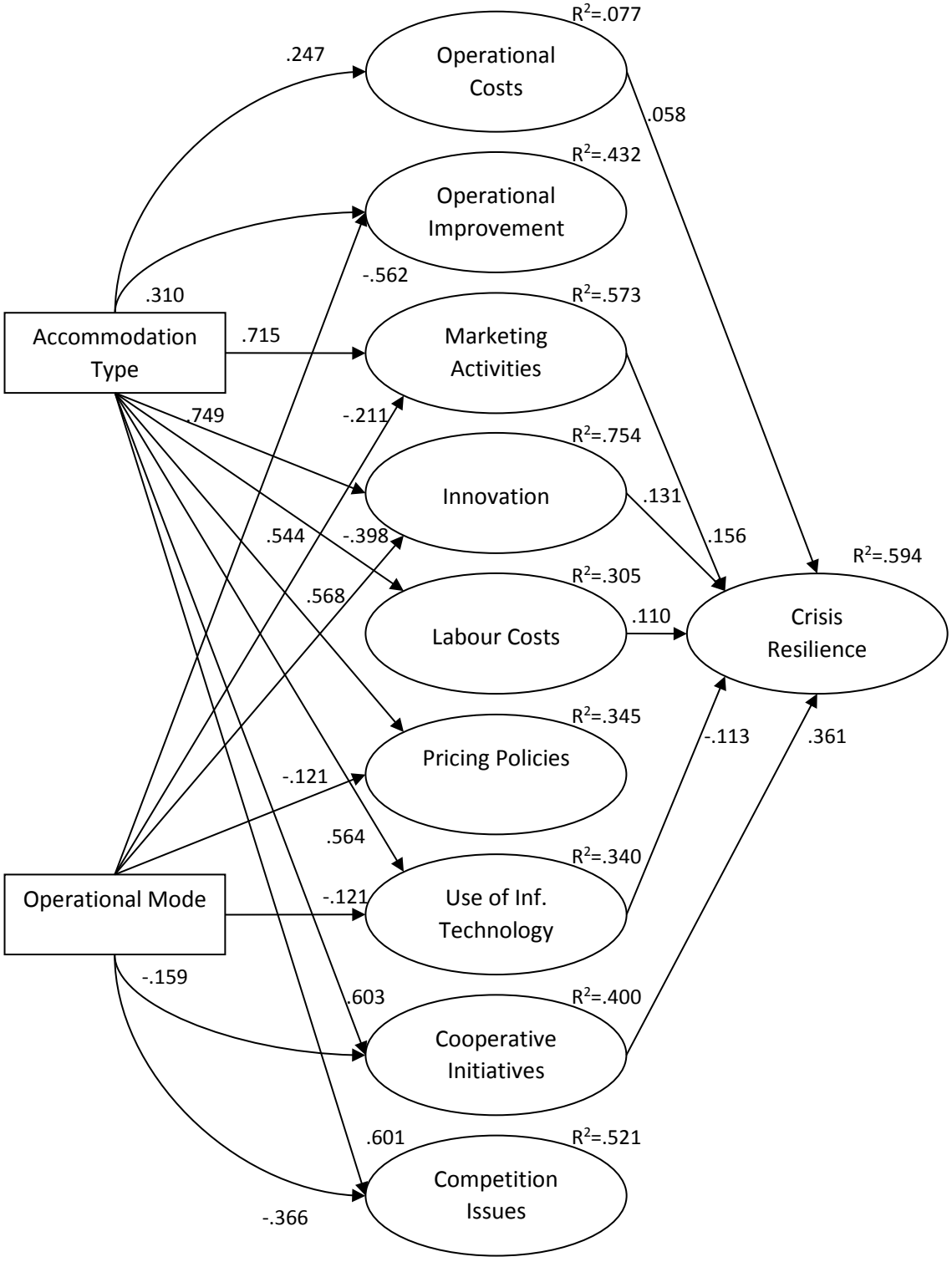
1243 Figure 3: Hotel Crisis Resilience in Greece



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